Sealed Collet

Application

ER collets are used for applications requiring through coolant, as well as for standard cutting tools such as drills, boring bars, end mills, reamers, taps and special tools.
They provide an effective solution for accurate controled coolant flow.
Front sealing collets are available for advanced high speed machines with through coolant spindles/turrets.
They provide maximum performance, high cutting speeds, extended tool life and high quality surface finish.

Features

- A revolutionary high precision front sealing collet with 1.00mm collapsibility that has through coolant capability
- Increased machining efficiency
- Extended tool life
- Has powerful gripping and parallel clamping
- Front sealing provides protection from contamination
- Fast chip removal from work piece

Advantages

- High-pressure coolant supply up to 100 bar
- Eliminates coolant flow interference

Notes

- For maximum security and clamping power, the cutting tool shank must be inserted into the collet to a minimum depth of 2 X shank diameter
- In sealed collet JET2 the nozzle must be adjusted directly to the flute of the cutting tool
- Suitable for all shank standards

TaeguTec ER Coolit Sealed Collet

Two types:

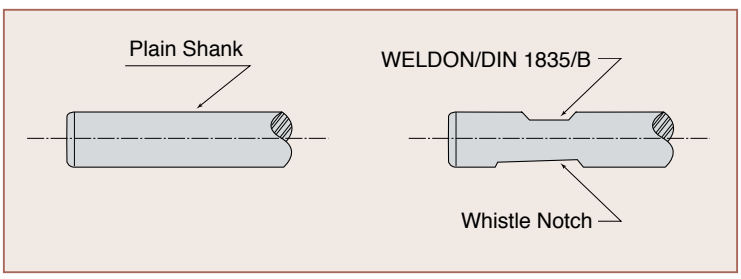
Sealed collet jet

For straight shank cutting tools with internal coolant supply

Sealed collet jet 2

With angular double nozzle.
Coolant flow is direct to the cutting edge
- for use with standard straight shank cutting tools (without coolant hole)

Shank Standards



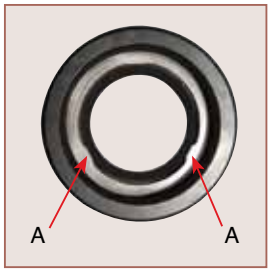
ER - Top Clamping Nut DIN 6499

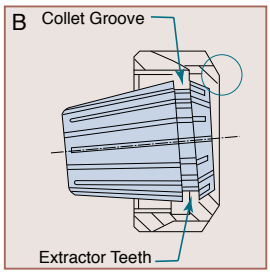
Description
The friction ER Nut has a unique two piece exclusive friction mechanism combining radial and angular self-centering movements.

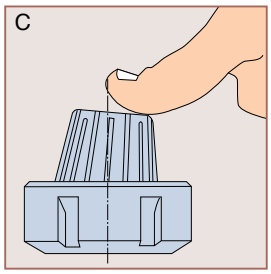
Features
Unique two piece friction bearing
Radial and angular float for better concentricity.
Powerful gripping force, 50-100% higher than standard ER nut due to the friction bearing mechanism
Balanced for higher spindle speed due to unique extractor teeth design
Compact design - general dimensions and size range are the same as the standard nut
Sealed design for use with sealed collets

Operation
To insert collet: Always assemble the collet into the nut before mounting onto the collet chuck.

Inserting Procedure
Insert the collet slantwise, fitting the two protruding extractor teeth **(A)** into the collet groove **(B)**.
Place the two parts onto a clean and horizontal surface.
Press down with your thumb on the back end of the collet until it clicks into place **(C)**.

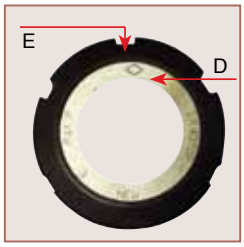


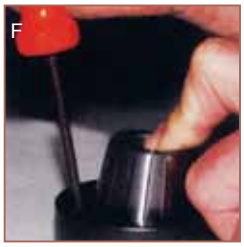




Important
Never insert the collet parallel to the extractor ring. This will chip or break the teeth of the extractor.
When unclamping the nut, the collet will self release from the chuck by means of the extractor teeth.

Extracting Procedure
1. Align the diamond-shaped engraved logo which is on the silver ring **(D)** to any of the key slots **(E)** of the nut.
2. Place the nut with the collet facing down on a clean and horizontal work surface.
3. Insert a screwdriver vertically between the nut slots and the collet – on the reverse side of the diamond shaped engraved logo **(D)**.
4. Tilt the screwdriver outwards while helping the extraction by pushing the back of the collet in the opposite direction **(F)**.





Note:
For maximum performance the clamping nut thread and collet taper must be cleaned and oiled before use.

Recommended Clamping Torque for Standard ER & ER-Top Clamping Nut

Nut type	Kg x m
ER-11	5
ER-11M	3
ER-16	7
ER-16M	4
ER-20	12
ER-20M	8
ER-25	20
ER-32	22
ER-40	25
ER-50	35

Important:
The torque is calculated to suit the maximum diameter capacity of each collet. The torque should be gradually reduced when used with a smaller shank size.

TSK Slim Collet Chuck

Features & Advantages

- Excellent accuracy & good gripping power by gentle taper angle (ER collet : 8º, TSK collet : 4º)
- Slim design for deep and cavity machining
- Suitable on high speed machining
- Variety of TSK collets (normal & coolant type)
- General machining using drill & end mill

Application

- General machining using drill & end mill
- High speed machining for Mold & Die industry
- Accurate machining using reamer & end mill

How to assemble the collet with a nut

a. Assembly Device (provided with the set)

b. Nut

c. Collet

❶ Insert the back end of the collet (c) into the assembly device (a)

❷ Insert the combined part (a+c) in the nut (b)

❸ Pluck out the assembly device (a) from the remaining part (b+c)

Quick-Change System

DIN 69871
HSK
BT MAS 403

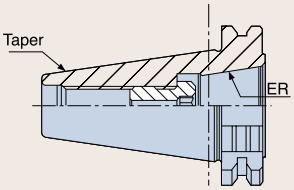
T-CLICK Advantages

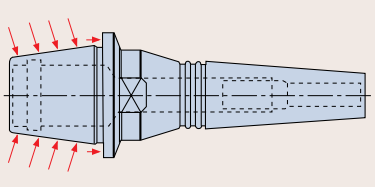
- Taper and face contact
- Ideal for High Speed Machining
- High precision – low runout
- Excellent rigidity
- Quick and easy clamping

Quick-Change Advantages

- Quick tool change - The taper shank and the holder connect in a quick half turn.
- No thermal shock on holder taper
- Flexibility in diameter and length
- Eliminates the use of extension chuck
- No spare parts required
- T-CLICK blanks available to provide custom made tooling
- Shrink clamping for solid carbide tooling

Tightening torque: 235N.m





Balanceable Collet Chuck System

T-BALANCE

- Direct reading precision rings for high grade balance
- Simple procedure on all types of balancing machines
- Static and dynamic balance

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Balancing Elements

Introduction

Balancing is the process of ensuring the mass distributed by a body rotates on its axis without unbalance centrifugal force.

Balancing reduces the risks of vibration, ensures lower strain on machine tool spindle, permits higher cutting data, extends tool life and improves machining conditions.

Available measuring equipment enables unbalance to be reduced to minimal amounts. However, it would be uneconomical to exaggerate the quality requirements. It has therefore become necessary to determine to what extent the unbalance should be reduced, and where the optimum economic and technical compromise on balance quality requirements would be struck.

Definition

G - Balance quality (mm/s)
e - Specific unbalance (g × mm/kg)
Ω - Speed (rad/s)
N - Speed (rpm)

M - Mass of the body (kg)
m - Mass of the unbalance (g)
r - Radius of the unbalance (mm)
U - Residual unbalance (g × mm)

$$e = \frac{U}{M} => U = M \times e \qquad \Omega = \frac{2\pi N}{60} = \frac{\pi N}{30}$$

Operation

Residual unbalance equals the tool's mass (M) multiplied by its eccentricity (e). Eccentricity measures the extent to which the tool's weight is off-center. It is defined as the distance from the tool's center of the rotation to its true center of mass.

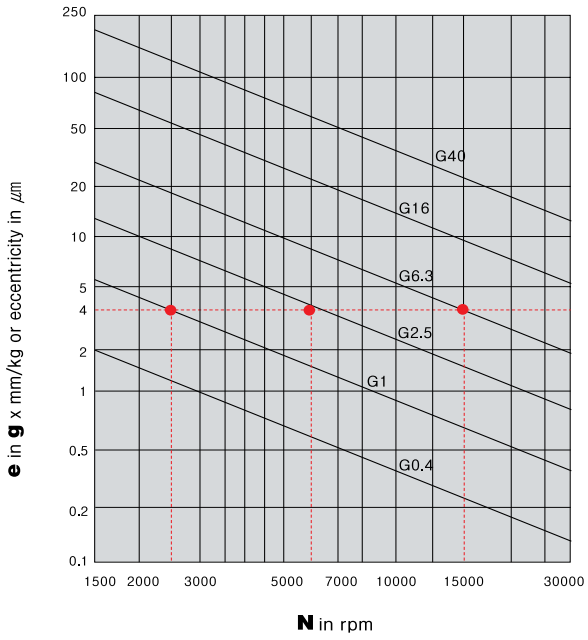
Eccentricity is measured in microns and tool mass is measured in kilograms. The units yield a residual unbalance in gram-millimetres.

Any two sets of mass and eccentricity that yield the same unbalance value will have the same effect on the tool, so long as the residual unbalance is in the same plane perpendicular to the rotation axis.

$U = r \times m$

The residual unbalance is independent of the speed. This value reflects the unbalance mass and its distance from the true center of mass. The residual unbalance value is measured on balancing machines.

Balancing Elements



T-HYCHUCK

Features & Advantages

- Consistent gripping force
- Excellent Accuracy (run-out : within 5㎛)
- Convenient and safe tool change using a clamping screw
- Can use THC straight collets (normal & coolant type)

Application

- Accurate machining – fine milling
  – reaming
  – fine boring
- Drilling – small diameter using carbide drill
  – for Al or cast iron

Operation

- Tool Mounting
  - Insert the tool shank between Lmax and Lmin (Fig 1) and then, turn the clamping screw clockwise until it can no longer rotate

- Tool Releasing
  - To release the tool from the hydraulic chuck, turn the clamping screw in a counter clock-wise direction approximately 5 or 6 evolutions and remove the tool shank

- **Notice**
  - Eliminate grease, coolant oil and any dirt from the internal bore of the Hydraulic chuck and tool shank prior to mounting
  - Ensure the minimum chucking length (L min) is maintained (see fig 1 & table 1)
  - Cylindrical tool shanks available in accordance with h6 tolerance (table 2) and Ra min =0.3㎛ (ground) and Weldon shanks should be used in collet only
  - Remove the end tool from the hydraulic chuck when not in use for long periods of time
  - Do not turn the clamping screw prior to tool mounting in the hydraulic chuck

*Please refer to the backface for information tables.

Figure 1. Tool structure

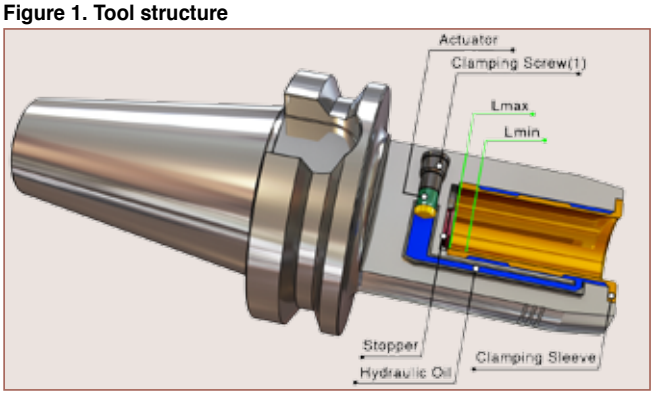


Table 1. recommended minimum & maximum depth (L) of end tool insertion

Inner bore diameter Ø(mm)	L min (mm)	L max (mm)
6	27.5	37.5
8	27.5	37.5
10	32.5	42.5
12	37.5	47.5
14	37.5	47.5
16	42.5	52.5
20	42.5	52.5
25	51	61
32	55	65

Table 2. h6 tolerance range

Shank size Ø(mm)		h6 tolerance range(㎛)
	3	0
		-6
3	6	0
		-8
6	10	0
		-9
10	18	0
		-11
18	30	0
		-13
30	50	0
		-16

Table 3. clamping torque

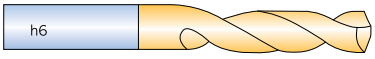
Inner bore diameter Ø(mm)	Calmping torque(N*m)
6	10
8	25
10	40
12	65
14	90
16	120
20	240
25	260
32	450

Thermal T-SHRINK Chucking System

T-SHRINK Chucking System

The thermal T-SHRINK ER Collet Chucking System is an enhancement to the existing popular ER system.
The T-SHRINK collets utilize the thermal shrink phenomena for rigid clamping of solid carbide cutters.
This new system provides higher torque, precision runout and better repeatability.
The T-SHRINK Collets with their slim design and different projection length
allows the user to reach into deeper cavities and perform narrow milling applications.
TaeguTec offers a complete system for T-SHRINK ER Collets,
including a uniquely designed heating unit with a portable heating handle.
The unit is equipped with a high-tech temperature control for easy and
practical use at the machining center or in the tool room.

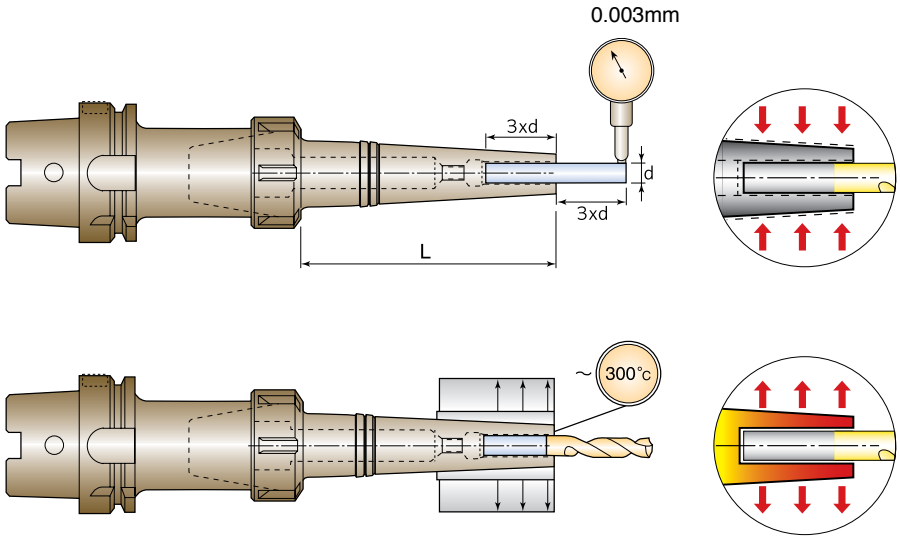
For carbide tools only



L(mm)	Max T.I.R
35	7μm
60	9μm
85	10μm

Features

- Slim design to maximise effectiveness and application access
- Flexible - fits into standard ER chucks
- High torque transfer
- Rigid clamping of carbide tools
- High precision – low runout
- Perfect repeatability
- Vibration damping
- Coolant JET2 available
- Symmetrical design for High Speed Machining
- Quick and easy tool changing
- Unique T-SHRINK heating unit with portable handle



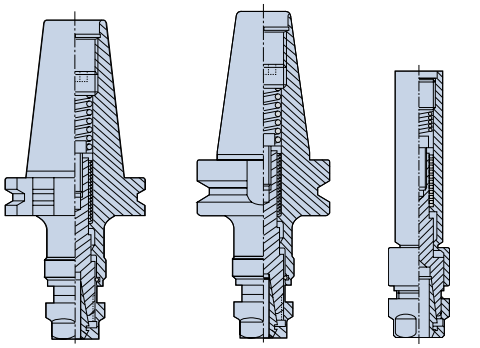
Advantages

- Short overhang
- Suitable for T-SHORT and T-SHRINK collets
- High gripping force
- Reduces vibration
- Improved runout and repeatability
- Balanced to G2.5, 20,000 rpm
- Symmetrical design for High Speed Machining
- Cost effective

GTI-Tap Attachment

Description
Short tap chucks for ER collets

Application
Axial-float/tension/compression type for CNC milling machines and lathes with reversing motors and rigid tap ping

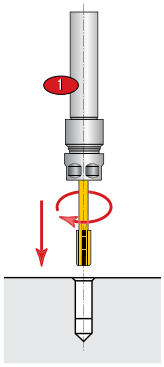


Features
- Compensates for machine feed and tap pitch variance
- Floating mechanism compensates for misalignment between tap and workpiece
- Right and left-hand tapping

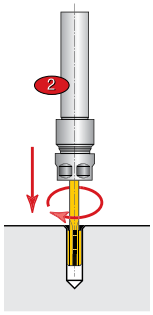
Advantages
- Practical and efficient tap holding by the ER spring collet without using drive jaw
- Compact design for minimal clearance applications
- Heavy-duty design for high torque drive ensures the same accuracy as the tap itself

Operation
For through and blind hole tapping:

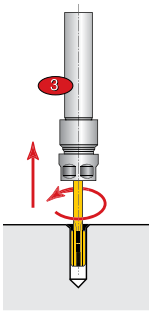
❶ Enter feed rate according to thread pitch (or 1-2% lower), and set spindle to starting point with 0.08mm clearance.



❷ Start spindle forward with right hand rotation until reaching desired depth.



❸ Stop feed and rotation and reverse to starting point.

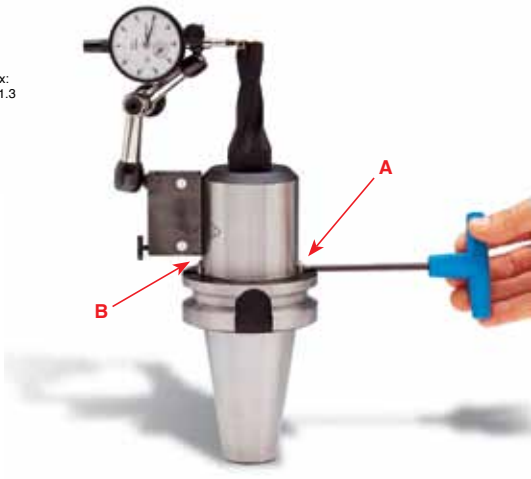


FITBORE / Holder for Adjustable Drilling Diameter

Adjustable Rotary Tool Holder Indexable Insert Drills

Application
- For use on machining centres and drilling machines

Features
- Diameter adjustment range – 0.30mm to +1.30mm
- Guaranteed bore tolerance of ±0.02mm
- Through the shank coolant design or “Type B” coolant through the flange
- Coolant pressure up to 70 bar



Operation
Best results are achieved on a preset machine or similar device.

1. To adjust the offset - slacken clamp **screw A**
2. Adjust with **screw B** and set to minus 0.20mm below required diameter
3. Tighten clamp **screw A**
4. Take a trial cut and measure the bore diameter
5. Adjust to suit requirements
6. Final adjustment can be made on the machine using a dial indicator or on a presentable

GYRO - Radial and Angular Alignment of Tool Holder

Advantages
- Easy adjustment for correcting misalignment between chuck and turret axis (drill and workpiece)
- Precise and efficient tool clamping with ER collets and ER sealed Coolit Jet collets
- Quick functional adjustment is made on machine by using plug and ring gauge kit

Operation
Operating instructions are provide with each tool supplied.

Notes
- Coolant supply should be minimum 10 bar and maximum 80 bar for small diameter oil hole drills - ranging from 3~20mm. (the normal machine pressure of 4 bar is insufficient)
- Coolant filtration is important to eliminate chips from blocking the drill oil hole
- To ensure maximum performance of the GYRO, the backlash of the turret indexing and support axis mechanism should be checked and re-adjusted according to the machine standard

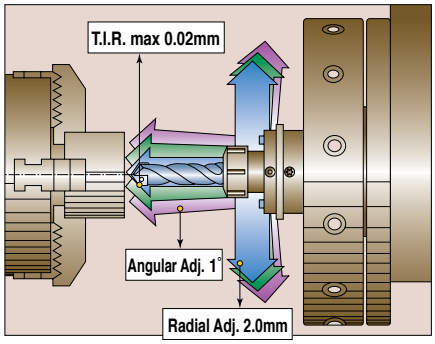
GYRO - Radial and Angular Alignment of Tool Holder

Adjustable Tool Holder for Easy Adjustment of Radial and Angular Misalignment

Application
Gyro is a rugged and adjustable toolholder to solve drilling, tapping and reaming problems encountered on CNC and turret lathes. Its unique design allows smooth and easy adjustment of radial and angular misalignment between chuck and turret.

Gyro reduces total machining time by making it possible to complete machining of holes in one drilling step and achieve tolerances as close as 0.01mm, thereby eliminating subsequent boring or reaming operations.

- A breakthrough in drilling technology for CNC lathes
- Dramatic increase in tool performance at reduced cost



Features
- Enables high precision drilling to a close tolerance of 0.01mm, to be performed as a final boring operation on CNC lathes
- Reduces machining cycle time by completing the bore in one drilling step, eliminating secondary turning and boring operations
- Prolongs tool life tenfold, especially when using HSS, solid and brazed carbide drills, taps and reamers
- Permits increase in speeds and feeds by up to 300%
- Coolant supply through the centre of the unit via the tool shoulder for oil fed drilling

TaeguTec GFI ER - Floating Reamer Collet Chuck

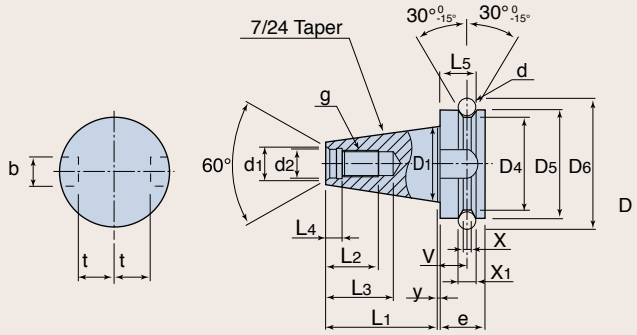
Floating chuck adjusts the misalignment between reamer and workpiece hole to ensure the same accuracy as the reamer itself.

Application
The GFI floating chuck is a unique holder to compensate for the radial misalignment existing in the reaming operations carried out on vertical and horizontal machine tools.

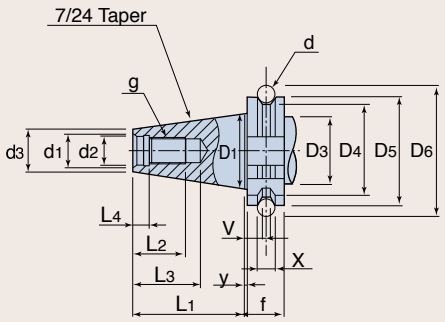
Features
- Radial self floating mechanism compensates misalignment between reamer and workpiece to ensure the same tolerance as the reamer itself
- The special self centering mechanism eliminates tapered and oversized bores

Advantages
- Unique ball bearing and axle drive shaft structure enables vertical and horizontal machining
- Precise and efficient clamping with ER spring collets of ER Coolit collets

Machining Center Shank Details



• MAS BT-403 •

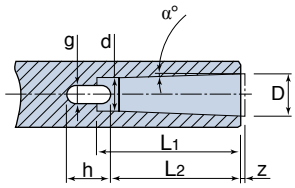


• DIN 69871 •
• ISO, ANSI •

Taper No	TaeguTec No	Shank		Thread						Taper				
		D_1	L_1	d_1	d_2	g	L_2	L_3	L_4	b	L_5	t	t_1	j
30	MAS	31.75	48.4 ±0.2	14	12.5 H8	M12	24min	34min	7.0 $^{+0.5}_{0}$	16.1 H12	17min	16.3 $^{0}_{-0.2}$		
	ISO													
	ANSI													
	DIN	31.75	47.8 $^{0}_{-0.3}$	14	13	M12×1.75	24min	33.5min	5.5 $^{+0.5}_{0}$	16.1 H12		16.4 $^{0}_{-0.4}$	19 ^{0}	15 $^{0}_{-0.3}$
40	MAS	44.45	65.4 $^{\pm0.2}$	19	17 H8	M16×2	30min	43min	9.0 $^{+0.5}_{0}$	16.1 H12	21min	22.6 $^{0}_{-0.2}$		
	ISO	44.45	68.4 $^{0}_{-0.3}$	19.0max	17 H8	M16×2	32min	42.5min	8.2 $^{+0.5}_{0}$	16.1 H12		22.8 $^{0}_{-0.4}$	25.0 $^{0}_{-0.4}$	18.50 $^{0}_{-0.3}$
	ANSI	44.45	68.4 $^{0}_{-0.3}$	18.5	16.4 $^{+0.4}_{0}$	M16×2	30min		4.75 $^{+0.5}_{0}$	16.1 $^{+0.2}$		22.8 $^{0}_{-0.4}$	26.0 $^{0}_{-0.4}$	
	DIN	44.45	68.4 $^{0}_{-0.3}$	19.0max	17 H7	M16×2	32min	42.5min	8.2 $^{+0.5}_{0}$	16.1 H12		16.4 $^{0}_{-0.4}$	25.0 $^{0}_{-0.4}$	18.5 $^{0}_{-0.3}$
45	MAS	57.15	82.8 $^{\pm0.2}$	23	21 H8	M20×2.5	38min	53min	11.0 $^{+0.5}_{0}$	19.3 H12	26min	29.1 $^{0}_{-0.2}$		24.00 $^{0}_{-0.3}$
	ISO	57.15	82.70 $^{0}_{-0.3}$	23.4max	21 H7	M20×2.5	40min	52.5min	10.0 $^{+0.5}_{0}$	19.3 H12		29.1 $^{0}_{-0.4}$	31.3 $^{0}_{-0.4}$	
	ANSI	57.15	82.7 $^{0}_{-0.3}$	22.5	20.4 $^{+0.4}_{0}$	M20×2.5	38min		5.25 $^{+0.5}_{0}$	19.3 H12		29.1 $^{0}_{-0.4}$	32.5 $^{0}_{-0.4}$	24 $^{0}_{-0.3}$
	DIN	57.15	82.70 $^{0}_{-0.3}$	23.4max	21 H7	M20×2.5	40min	52.5min	10.0 $^{+0.5}_{0}$	19.3 $^{+0.2}_{0}$		29 max		30.00 $^{0}_{-0.3}$
50	MAS	69.85	101.8 $^{\pm0.2}$	27	25 H8	M24×3	45min	62min	13.0 $^{+0.5}_{0}$	19.3 H12	31min	35.5 $^{0}_{-0.4}$	31.3 $^{0}_{-0.4}$	
	ISO	69.85	101.75 $^{0}_{-0.3}$	28.4max	25 H7	M24×3	47min	61.5min	11.5 $^{+0.5}_{0}$	25.7 H12		35.5 $^{0}_{-0.4}$	37.7 $^{0}_{-0.4}$	30 $^{0}_{-0.3}$
	ANSI	69.85	101.75 $^{0}_{-0.3}$	26.5	24.8 $^{+0.4}_{0}$	M24×3	45min		5.75 $^{+0.5}_{0}$	25.7 $^{+0.2}_{0}$		35.5 $^{0}_{-0.4}$	40.4 $^{0}_{-0.4}$	
	DIN	69.85	101.75 $^{0}_{-0.3}$	28.0max	25 H7	M24×3	47min	61.5min	11.5 $^{+0.5}_{0}$	25.7 H12		35.5 $^{0}_{-0.4}$	37.7 $^{0}_{-0.4}$	

Taper No	TaeguTec No	Flange									Reference		
		D_3	D_4	D_5	e	f	V	X	X_1	y	d_3	d	D_6
30	MAS		38	46 H8	20		13.6 ±0.1	4	8 +0.1	2 ±0.4	17.633	8	56.144
	ISO												
	ANSI												
	DIN	45max	44.3 $^{0}_{-0.5}$	50 $^{0}_{-0.1}$		15.90	11.1 ±0.1	3.75 $^{+0.15}_{0}$		3.2 ±0.1	17.808	7	59.3
40	MAS		53	63 H8	25		16.6 ±0.1	5	10 $^{+0.1}_{0}$	2 ±0.4	25.375	10	75.679
	ISO	44.7 $^{0}_{-0.5}$	56.25 $^{0}_{-0.5}$	63.55 $^{0}_{-0.1}$		15.90	11.1 ±0.1	3.75 $^{+0.15}_{0}$		3.2 ±0.1	24.500	7	72.30 ±0.05
	ANSI	44.7 $^{0}_{-0.5}$	56.25 $^{0}_{-0.5}$	63.55 $^{0}_{-0.1}$		15.90 $^{+0.1}_{0}$	11.1 ±0.1	3.75 $^{+0.15}_{0}$		3.18	24.500	7	72.30 ±0.05
	DIN	50 max	56.25 $^{0}_{-0.5}$	63.55 $^{0}_{-0.1}$		15.90	11.1 ±0.1	3.75 $^{+0.15}_{0}$		3.2 ±0.1	24.500	7	72.30 ±0.05
45	MAS		73	85 H8	30		21.2 ±0.1	6 $^{+0.15}_{0}$	12 $^{+0.1}_{0}$	3 ±0.4	33.000	12	100.216
	ISO	57.4 $^{0}_{-0.5}$	75.25 $^{0}_{-0.5}$	82.55 $^{0}_{-0.1}$		15.90	11.1 ±0.1	3.75 $^{+0.15}_{0}$		3.2 ±0.1	33.029	7	91.35 ±0.05
	ANSI	57.4 $^{0}_{-0.5}$	75.25 $^{0}_{-0.5}$	82.55 $^{0}_{-0.1}$		15.82 $^{+0.1}_{0}$	11.1 ±0.1	3.75 $^{+0.15}_{0}$		3.18	33.029	7	91.35 ±0.05
	DIN	63 max	75.25 $^{0}_{-0.5}$	82.55 $^{0}_{-0.1}$		15.90	11.1 ±0.1	3.75 $^{+0.15}_{0}$		3.2 ±0.1	33.029	7	91.35 ±0.05
50	MAS		85	100 H8	35		23.2 ±0.1	7	15 $^{+0.1}_{0}$	3 ±0.4	40.158	15	107.25 ±0.05
	ISO	70.1 $^{0}_{-0.5}$	91.25 $^{0}_{-0.5}$	97.50 $^{0}_{-0.1}$		15.90	11.1 ±0.1	3.75 $^{+0.15}_{0}$		3.2 ±0.1	40.173	7	107.25 ±0.05
	ANSI	70.1 $^{0}_{-0.5}$	91.25 $^{0}_{-0.5}$	98.45 $^{0}_{-0.1}$		15.82 $^{0}_{-0.1}$	11.1 ±0.1	3.75 $^{+0.15}_{0}$		3.18	40.173	7	107.25 ±0.05
	DIN	80max	91.25 $^{0}_{-0.5}$	97.50 $^{0}_{-0.1}$		15.90	11.1 ±0.1	3.75 $^{+0.15}_{0}$		3.2 ±0.1	40.173	7	107.25 ±0.05

MT Socket Details



Taper No	Taper		Taper Angle (α°)	D	d	L_1 (Max)	L_2 (Max)	g	h	z
MT0	1/19.212	0.05205	1° 29′ 27″	9.045	6.7	52	49	4.1	15	1
MT1	1/20.047	0.04988	1° 25′ 43″	12.065	9.7	56	52	5.4	19	1
MT2	1/20.020	0.04995	1° 25′ 50″	17.780	14.9	67	62	6.6	22	1
MT3	1/19.922	0.05020	1° 26′ 16″	23.825	20.2	84	78	8.2	27	1
MT4	1/19.254	0.05194	1° 29′ 15″	31.267	26.5	107	98	12.2	32	1.5
MT5	1/19.002	0.05263	1° 30′ 26″	44.399	38.2	135	125	16.2	38	1.5
MT6	1/19.180	0.05214	1° 29′ 36″	63.348	54.6	188	177	19.3	47	2
MT7	1/19.231	0.05200	1° 29′ 22″	83.058	71.1	258	241	28.8	69	2